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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/617,765	07/14/2003	Shunpei Yamazaki	740756-2631	4048

22204 7590 08/12/2005

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EXAMINER

BUEKER, RICHARD R

ART UNIT	PAPER NUMBER
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1763

DATE MAILED: 08/12/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/617,765

Applicant(s)

YAMAZAKI ET AL.

Examiner

Richard Bueker

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 May 2005.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5 and 14-37 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5 and 14-37 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 7/14/03
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: _____

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Claims 1-5 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In claim 1, the phrase "a vacuum evacuation processing chamber for making the inside of the film formation chamber vacuum" is unclear, non-idiomatic and indefinite. Applicants' specification (see paragraph bridging pages 26 and 27) indicates that "a vacuum evacuation processing chamber for making the inside of the film formation chamber vacuum" is intended to refer to a vacuum pump. Therefore, claim 1 should recite a vacuum pump. Applicants are respectfully requested to explain what this phrase is intended to include in addition to a vacuum pump.

Claims 14, 15 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Eida (6,633,121) taken in view of Edwards (5,259,881) and Tanabe (6,132,280). Eida discloses a manufacturing apparatus (see Fig. 11, for example) comprising a transporting chamber 24, a film formation chamber 22 and a processing chamber 21. Eida teaches (see col. 18, lines 43-50, and col. 26, lines 19-48, for example) that the film formation chamber 22 can include a molybdenum heating boat as an evaporation source for organic EL coating material. Eida teaches that the processing chamber 21 is for vacuum heating a substrate that is to be coated with an organic EL layer. The substrate is vacuum heated prior to being coated in chamber 22 to remove moisture (water) from the surface of the substrate. Eida teaches that water is a contaminant that must be removed prior to the coating step. Eida teaches (col. 18, lines 43-54, particularly lines 51-54) that using the transporting chamber 24 as in Fig. 11 is desirable because the substrate is not exposed to the outside atmosphere between the vacuum

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heating step and the organic EL film formation step. Eida does not discuss a step of vacuum heating a plurality of substrates simultaneously. Edwards (see Figs. 1-3) teaches (col. 1, line 5 to col. 3, line 4) that it is well-known in the electronics manufacturing industry to vacuum preheat a substrate to remove absorbed impurities such as water vapor prior to coating and etching processes in the formation of integrated circuits. Edwards teaches that it is desirable to conduct the vacuum heating on a plurality of substrates in a batch chamber to improve manufacturing efficiency. It would have been obvious to provide the manufacturing apparatus of Fig. 11 of Eida with a batch vacuum-heating chamber of the type taught by Edwards, for the desirable purpose of improving the manufacturing efficiency of Eida's apparatus. Also, Tanabe (see Fig. 1 and col. 12, lines 28-52, for example) teaches that an organic EL deposition apparatus should be provided with a batch-heating chamber to remove moisture from a plurality of substrates simultaneously. Tanabe provides even further motivation to provide the manufacturing apparatus of Fig. 11 of Eida with a batch vacuum-heating chamber of the type taught by Edwards.

Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Eida (6,633,121) taken in view of Edwards (5,259,881) and Tanabe (6,132,280) as stated above, and taken in further view of Spahn (6,237,529) or Kamata (JP 11-229123) who both disclose vacuum evaporation coating apparatus for forming organic EL films, wherein the apparatus includes a shutter having a hole. In Spahn, the closure plate (see element 20 of Figs. 1-6 or element 80 of Figs. 7 and 8) is a shutter having a hole. It is noted that the dictionary definition of "shutter" is "a movable cover, slide, etc.

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for an opening". The top plate of Spahn is a movable cover for the housing 10 or 70. Kamata also teaches the use of a shutter having an opening (see element 26A of Fig. 3, for example). It is also noted that the recited "evaporation source holder" reads on the vacuum chamber structure of Kamata, which holds the evaporation source 16 and the shutter 19. It would have been obvious to provide the apparatus of Eida with a shutter having a hole, for the reasons taught by either Spahn or Kamata.

Claims 17, 24, 25, 27, 29 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Eida (6,633,121) taken in view of Edwards (5,259,881) and Tanabe (6,132,280) as stated above, and taken in further view of Yamamoto (6,179,923), who teaches the step of providing a film thickness monitor 15 (see Fig. 2 and col. 4, lines 28-36) adjacent to the evaporation source holder in an organic EL vacuum evaporation apparatus, and it would have been obvious to provide the vacuum evaporation apparatus of Eida with such a monitor for accurately controlling the coating process. Yamamoto also provides moving means for his source holder as recited in claims 24, 25, 27, and 29, to improve the speed of maintenance of his apparatus. It would have been obvious to provide the apparatus of Eida with source holder moving means for that reason.

Claims 19, 20 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Eida (6,633,121) taken in view of Edwards (5,259,881) and Tanabe (6,132,280) as stated above, and taken in further view of Turner (5,512,320) who discloses a batch vacuum heater of the same type as disclosed by Edwards, and Turner teaches that batch heating can successfully be performed by using a plurality of plate

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heaters to heat the plurality of substrates simultaneously. It would have been obvious to use a batch heater having a plurality of plate heaters to heat the substrates in Eida's apparatus, because Turner teaches that his plate heaters will successfully perform the desired function of heating a plurality of substrates simultaneously.

Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Eida (6,633,121) taken in view of Edwards (5,259,881), Tanabe (6,132,280) and Turner (5,512,320) as stated above, and taken in further view of Spahn (6,237,529) or Kamata (JP 11-229123), who both disclose vacuum evaporation coating apparatus for forming organic EL films, wherein the apparatus includes a shutter having a hole. It would have been obvious to provide the apparatus of Eida with a shutter having a hole, for the reasons taught by either Spahn or Kamata.

Claims 22, 31, 32, 34, 36 and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Eida (6,633,121) taken in view of Edwards (5,259,881), Tanabe (6,132,280) and Turner (5,512,320) as stated above, and taken in further view of Yamamoto (6,179,923), who teaches the step of providing a film thickness monitor 15 adjacent to the evaporation source holder in an organic EL vacuum evaporation apparatus, and it would have been obvious to provide the vacuum evaporation apparatus of Eida with such a monitor for accurately controlling the coating process. Yamamoto also provides moving means for his source holder to improve the speed of maintenance of his apparatus. It would have been obvious to provide the apparatus of Eida with source holder moving means for that reason.

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Claim 28 is rejected under 35 U.S.C. 103(a) as being unpatentable over Eida (6,633,121) taken in view of Edwards (5,259,881), Tanabe (6,132,280) and Yamamoto (6,179,923) for the reasons stated above, and taken in further view of Spahn (6,237,529) or Kamata (JP 11-229123), who both disclose vacuum evaporation coating apparatus for forming organic EL films, wherein the apparatus includes a shutter having a hole. It would have been obvious to provide the apparatus of Eida with a shutter having a hole, for the reasons taught by either Spahn or Kamata.

Claim 35 is rejected under 35 U.S.C. 103(a) as being unpatentable over Eida (6,633,121) taken in view of Edwards (5,259,881), Tanabe (6,132,280), Yamamoto (6,179,923) and Turner (5,512,320) for the reasons stated above, and taken in further view of Spahn (6,237,529) or Kamata (JP 11-229123), who both disclose vacuum evaporation coating apparatus for forming organic EL films, wherein the apparatus includes a shutter having a hole. It would have been obvious to provide the apparatus of Eida with a shutter having a hole, for the reasons taught by either Spahn or Kamata.

Claims 24 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Eida (6,633,121) taken in view of Edwards (5,259,881) and Tanabe (6,132,280) as stated above, and taken in further view of Yamazaki (2001/0006827) (see Figs. 1-6), who teaches that an organic EL layer can be efficiently deposited by vacuum evaporation by moving the evaporation source holder. It would have been obvious to modify the apparatus of Eida by providing it with an organic EL evaporation chamber of the type taught by Yamazaki, including a means for moving the evaporation source holder, for the desirable purpose of improving deposition efficiency as taught by

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Yamazaki. Also, Yamazaki's source holder moves in multiple scans, which requires moving in multiple directions. This movement reads on moving in an x-axis direction and a y-axis direction as recited in claim 25.

Claims 25 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Eida (6,633,121) taken in view of Edwards (5,259,881), Tanabe (6,132,280) and Yamazaki (2001/0006827) for the reasons stated in the previous paragraph, and taken in further view of Yamada (2002/0076847), Bennett (2,435,997) and/or Peng (6,641,674). Yamazaki (see paragraph 12) teaches that the vapor deposition source holder can be moved in multiple scans to coat a large board. Yamazaki does not state that "the evaporation source holder is rotated when switching between the x-axis direction and the y-axis direction" as recited in claim 26. Bennett also discloses a vapor deposition device in which a vapor deposition source holder is scanned in a manner analogous to that of Yamazaki. Bennett (see Figs. 1 and 2) makes clear that such a scanned vapor deposition source is moved in a plurality of directions, and it would have been obvious to provide the apparatus of Yamazaki with a vapor deposition source holder moving means of the type taught by Bennett, because Bennett teaches that his vapor deposition source holder moving means can successfully coat a large substrate as desired by Yamazaki. Also, Bennett's source holder rotates when changing directions (see Figs. 2 and 4 of Bennett). Also, Yamada teaches an apparatus for vapor coating a large substrate with an organic EL layer in a manner analogous to that of Yamazaki. Yamada (see paragraph 105, for example) teaches in particular that an organic EL layer can successfully be deposited by using a single point

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source that is moved relative to the substrate. It view of this teaching by Yamada, it would have been expected and obvious to one skilled in the art that a vapor deposition source holder moving means of the type taught by Bennett could successfully be used to deposit an organic electroluminescent material coating layer of the type desired by Yamazaki. Peng is cited because he also teaches a process of vacuum evaporation of an organic EL layer, and he also teaches that it is desirable to move the evaporation source holder. Peng provides means for moving the source in plural directions, including up, down and rotationally, which includes components of motion along plural horizontal axis directions. It also would have been obvious to provide Peng's deposition chamber and source moving means for Eida's apparatus.

Claims 31 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Eida (6,633,121) taken in view of Edwards (5,259,881), Tanabe (6,132,280) and Yamazaki (2001/0006827) for the reasons stated in the rejection of claims 24 and 25 above, and taken in further view of Turner (5,512,320) who discloses a batch vacuum heater of the same type as disclosed by Edwards. Turner teaches that batch heating can successfully be performed by using a plurality of plate heaters to heat the plurality of substrates simultaneously. It would have been obvious to use a batch heater having a plurality of plate heaters to heat the substrates in Eida's apparatus, because Turner teaches that his plate heaters will successfully perform the desired function of heating a plurality of substrates simultaneously.

Claims 32 and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Eida (6,633,121) taken in view of Edwards (5,259,881), Tanabe (6,132,280),

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Yamazaki (2001/0006827) and Turner (5,512,320) for the reasons stated in the preceding paragraph rejection of claims 31 and 32, and taken in further view of Yamada (2002/0076847), Bennett (2,435,997) and/or Peng (6,641,674). Yamazaki (see paragraph 12) teaches that his vapor deposition source holder can be moved in multiple scans to coat a large board. Yamazaki does not state that "the evaporation source holder is rotated when switching between the x-axis direction and the y-axis direction" as recited in claim 26. Bennett also discloses a vapor deposition device in which a vapor deposition source holder is scanned in a manner analogous to that of Yamazaki. Bennett (see Figs. 1 and 2) makes clear that such a scanned vapor deposition source is moved in a plurality of directions, and it would have been obvious to provide the apparatus of Yamazaki with a vapor deposition source holder moving means of the type taught by Bennett, because Bennett teaches that his vapor deposition source holder moving means can successfully coat a large substrate as desired by Yamazaki. Also, Bennett's source holder rotates when changing directions (see Figs. 2 and 4 of Bennett). Also, Yamada teaches an apparatus for vapor coating a large substrate with an organic EL layer in a manner analogous to that of Yamazaki. Yamada (see paragraph 105, for example) teaches in particular that an organic EL layer can successfully be deposited by using a single point source that is moved relative to the substrate. In view of this teaching by Yamada, it would have been expected and obvious to one skilled in the art that a vapor deposition source holder moving means of the type taught by Bennett could successfully be used to deposit an organic electroluminescent material coating layer of the type desired by Yamazaki. Peng is

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cited because he also teaches a process of vacuum evaporation of an organic EL layer, and he also teaches that it is desirable to move the evaporation source holder. Peng provides means for moving the source in plural directions, including up, down and rotationally, which includes components of motion along plural horizontal axis directions. It also would have been obvious to provide Peng's deposition chamber and source moving means for Eida's apparatus.

Claims 1, 2, 4 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamazaki (2001/0006827) taken in view of Spahn (6,237,529) and Van Slyke (2003/0101937) and taken in further view of Eida (6,633,121), Edwards (5,259,881) and Turner (5,512,320). Yamazaki (see Fig. 6, for example) discloses an apparatus comprising a loading chamber (604), a transporting chamber (601), plural film formation chambers (606, 608, 610 and 612) and a processing chamber (605). Yamazaki teaches that each film formation chamber includes the structure shown in Figs. 2A and 2B, which includes a mask alignment means, a substrate holding means, an evaporation source holder and a means for moving the evaporation source holder. Spahn (see Figs. 1-8) and Van Slyke (see Figs. 2-8) disclose apparatus analogous to that of Yamazaki. Spahn discloses an evaporation source that includes a container that seals an evaporation material (see Figs. 1 and 2 and the paragraph bridging cols. 4 and 5). In Spahn's container, the top plate (20 or 80) is a shutter and also has a hole in it as recited in claim 4. Van Slyke (see Figs. 7 and 8) discloses a modification of Spahn's evaporation source, and teaches that a moving means should be provided to move the source relative to the substrate to be coated. Van Slyke is cited in the rejection to make

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clear that Spahn's evaporation source is of a type that is intended to be moved by a moving means. It would have been obvious to use a source container of the type taught by Spahn as the evaporation source of Yamazaki, because Spahn teaches that his evaporation source can successfully be used for forming an organic EL layer as desired by Yamazaki. Yamazaki teaches that a preprocessing chamber 605 can be included in his apparatus, but he does not discuss the use of a vacuum-heating chamber having plural plate heaters for his preprocessing chamber. Eida (see col. 18, lines 43-50, and col. 26, lines 19-48, for example), however, teaches that it is desirable to provide a vacuum-heating chamber as a preprocessing chamber in an organic EL manufacturing apparatus. Eida teaches that his vacuum-heating chamber desirably removes water vapor from a substrate to be coated. Also, Edwards teaches that bulk vacuum preheating for vacuum heating a plurality of substrates simultaneously is desirable for mass production. Also, Turner teaches that plate heaters provide a successful heating means for bulk vacuum preheating of plural substrates. Therefore, in view of the teachings of Eida, Edwards and Turner, it would have been obvious to one skilled in the art to provide the apparatus of Yamazaki with a preprocessing chamber that uses a plurality of heating plates to preheat a plurality of substrates to remove water vapor prior to forming an organic EL layer on the substrates, for the desirable purpose of removing water vapor in an efficient manner for mass production of organic EL devices.

Claims 2 and 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamazaki (2001/0006827) taken in view of Spahn (6,237,529) and Van Slyke (2003/0101937), and taken in further view of Eida (6,633,121), Edwards (5,259,881)

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and Turner (5,512,320), for the reasons stated in the preceding paragraph rejection, and taken in further view of Yamada (2002/0076847), Bennett (2,435,997) and/or Peng (6,641,674). Yamazaki (see paragraph 12) teaches that the vapor deposition source holder can be moved in multiple scans to coat a large board. Yamazaki does not state that "the evaporation source holder is rotated when switching between the x-axis direction and the y-axis direction" as recited in claim 3. Bennett also discloses a vapor deposition device in which a vapor deposition source holder is scanned in a manner analogous to that of Yamazaki. Bennett (see Figs. 1 and 2) makes clear that such a scanned vapor deposition source is moved in a plurality of directions, and it would have been obvious to provide the apparatus of Yamazaki with a vapor deposition source holder moving means of the type taught by Bennett, because Bennett teaches that his vapor deposition source holder moving means can successfully coat a large substrate as desired by Yamazaki. Also, Bennett's source holder rotates when changing directions (see Figs. 2 and 4 of Bennett). Also, Yamada teaches an apparatus for vapor coating a large substrate with an organic EL layer in a manner analogous to that of Yamazaki. Yamada (see paragraph 105, for example) teaches in particular that an organic EL layer can successfully be deposited by using a single point source that is moved relative to the substrate. In view of this teaching by Yamada, it would have been expected and obvious to one skilled in the art that a vapor deposition source holder moving means of the type taught by Bennett could successfully be used to deposit an organic electroluminescent material coating layer of the type desired by Yamazaki. Peng is cited because he also teaches a process of vacuum evaporation of an organic

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EL layer, and he also teaches that it is desirable to move the evaporation source holder. Peng provides means for moving the source in plural directions, including up, down and rotationally, which includes components of motion along plural horizontal axis directions. It also would have been obvious to provide Peng's deposition chamber and source moving means for Eida's apparatus.

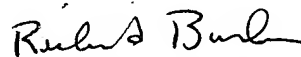
The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. These additional references disclose other PVD shields having holes.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Richard Bueker whose telephone number is (571) 272-1431. The examiner can normally be reached on 9 AM - 5:30 PM, Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parvis Hassanzadeh can be reached on (571) 272-1435. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Richard Bueker
Primary Examiner
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